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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/828,370    03/28/97    SMITH    J    042390.P3973

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LM91/0423

EXAMINER

TROST IV, W

ART UNIT

PAPER NUMBER

2744

DATE MAILED:

04/23/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**08/828,370**

Applicant(s)  
**Smith**

Examiner  
**William Trost**

Group Art Unit  
**2744**



☒ Responsive to communication(s) filed on Sep 21, 1998

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-22 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-22 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☒ The proposed drawing correction, filed on Sep 21, 1998 is ☒ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 7, 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Oto.

Regarding claim 1, Oto discloses a dual band radio receiver (Fig. 3) comprising a local oscillator (22) configured to generate a LO signal, a first mixer device (20A) configured to receive the LO signal and a first RF signal (a) within a first band (between 500 and 1500 MHZ) and responsive to output a first IF signal, a second mixer device (20B) configured to receive the LO signal and a second RF signal (b) within a second band (between 1500 MHZ and 2500 MHZ) and output a second IF signal (note abstract, for both IF signals), and the local oscillator is configured to operate within a third band (900 to 2100 MHZ) located between the first and second bands (Local oscillator covers frequencies overlapping the first and second bands, and thus, is located between both bands).

Regarding claim 7, Oto further discloses that the third band is positioned half-way between the first and second bands (note, center of LO signal is 1500 MHZ, which is also halfway between edge of first band, 500 MHZ and edge of second band, 2500 MHZ).

Regarding claim 15, Oto discloses in a dual-band radio receiver (Fig. 3) configured to receive RF signals within first and second bands (500-1500 and 1500-2500 MHZ, respectively), a

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method for converting the RF signal into an IF signal comprising the steps of determining whether the RF signal belongs to one of the first or second bands (Col. 4;1-12, routing signals to appropriate amplifiers), and generating the IF signal by mixing the RF signal with an LO signal belonging to a third band located between the first and second bands (Local oscillator covers frequencies overlapping the first and second bands 900-2100 MHZ, and thus, is located between both bands).

Regarding claims 16-18, Oto further discloses that if the RF signal belongs to a first band (a), it is routed to a first mixer device (20A) and if the RF signal belongs to the second band (b), it is routed to a second mixer device (20B). Oto further discloses that the third band is positioned half-way between the first and second bands (note, center of LO signal is 1500 MHZ, which is also halfway between edge of first band, 500 MHZ and edge of second band, 2500 MHZ).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oto.

Regarding claims 2, 9, Oto discloses all the particulars of claim 1, as discussed above.

Oto further discloses the use of a single IF filter (28) and a switching device (56) coupled thereto, as well as the IF filter being coupled to the mixer devices (via switch 56). Oto discloses that the

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selected band is passed to a single IF filter. Oto fails to explicitly disclose the use of dual IF filters in the signal path, but as Oto discloses that it is known in the art to separate the RF signals into dual processing sections, where each signal is mixed separately, and Oto further discloses it is known to filter both paths (note filters 54, 58), it would have been obvious to one of ordinary skill in the art at the time of the invention to include a plurality of IF filters connected to the mixer circuit in order to provide redundancy within the system, as the end product of the demodulation process is the same in each case.

5. Claims 3-6, 8, 10-14, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oto in view of Smith et al (hereinafter Smith).

Regarding claim 3, Oto discloses all the particulars of the claim except for the control circuit coupled to the local oscillator. However, Smith teaches in an analogous art, a multi-band radio receiver in which a control circuit (103) is connected to a local oscillator (105) and a switching device (104). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a controller as taught by Smith, to the system of Oto, in order to provide automated control of the selection of an appropriate frequency band.

Regarding claims 4-6, Oto discloses all the particulars of the claim except the frequency bands being 1.910-1.930 GHz, 2.155-2.2385 GHz, and 2.40-2.4835 GHz for the first, third, and second frequency bands, respectively. Oto discloses the frequency bands being between .5 and 2.5 GHz, as discussed above, in the rejection of claims 1 and 7.

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However, Smith teaches a dual-band radio receiver which utilizes the 1.910 -1.930 GHz band and the 2.4-2.4835 GHz band (note Col. 3;8-18, description of frequency bands in which the radio receiver operates). Smith further teaches that for reception of frequencies, a local oscillator (721) outputs a frequency ( $F_n$ ) such that generates an IF signal for two frequency bands, located  $F_n$  above and below the intermediate frequency, i.e. - positioned halfway between the two frequency bands. As 2.155-2.2385 GHz is halfway between the 1.910-1.930 and 2.4-2.4835 GHz bands, Smith implicitly teaches that the third band (local oscillator frequency) is in the 2.155-2.2385 GHz range. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the particular frequency bands in order to expand communications capabilities by utilizing unlicensed spectrum.

Regarding claim 8, Oto discloses a system comprising a dual band radio receiver (Fig. 3) comprising a local oscillator (22) configured to generate a LO signal, a first mixer device (20A) configured to receive the LO signal and a first RF signal (a) within a first band (between 500 and 1500 MHZ) and responsive to output a first IF signal, a second mixer device (20B) configured to receive the LO signal and a second RF signal (b) within a second band (between 1500 MHZ and 2500 MHZ) and output a second IF signal (note abstract, for both IF signals), and the local oscillator is configured to operate within a third band (900 to 2100 MHZ) located between the first and second bands (Local oscillator covers frequencies overlapping the first and second bands, and thus, is located between both bands). Oto fails to disclose a transmitter circuit, but does disclose the use of communication services (CS signals).

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However, to provide further evidence, Smith teaches a system comprising a transmitter circuit (1) and a dual band radio receiver (7), as in the system of Oto. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a transmitter circuit in order to provide two-way communication between users.

Regarding claim 10, Oto discloses all the particulars of the claim except for the control circuit coupled to the local oscillator. However, Smith teaches in an analogous art, a multi-band radio receiver in which a control circuit (103) is connected to a local oscillator (105) and a switching device (104). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a controller as taught by Smith, to the system of Oto, in order to provide automated control of the selection of an appropriate frequency band.

Regarding claims 11-13, Oto discloses all the particulars of the claim except the frequency bands being 1.910-1.930 GHz, 2.155-2.2385 GHz, and 2.40-2.4835 GHz for the first, third, and second frequency bands, respectively. Oto discloses the frequency bands being between .5 and 2.5 GHz, as discussed above, in the rejection of claims 1 and 7.

However, Smith teaches a dual-band radio receiver which utilizes the 1.910 -1.930 GHz band and the 2.4-2.4835 GHz band (note Col. 3;8-18, description of frequency bands in which the radio receiver operates). Smith further teaches that for reception of frequencies, a local oscillator (721) outputs a frequency ( $F_n$ ) such that generates an IF signal for two frequency bands, located  $F_n$  above and below the intermediate frequency, i.e. - positioned halfway between the two frequency bands. As 2.155-2.2385 GHz is halfway between the 1.910-1.930 and 2.4-2.4835 GHz

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bands, Smith implicitly teaches that the third band (local oscillator frequency) is in the 2.155-2.2385 GHz range. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the particular frequency bands in order to expand communications capabilities by utilizing unlicensed spectrum.

Regarding claim 14, Oto further discloses that the third band is positioned half-way between the first and second bands (note, center of LO signal is 1500 MHZ, which is also halfway between edge of first band, 500 MHZ and edge of second band, 2500 MHZ).

Regarding claims 19-20, Oto discloses all the particulars of the claim except the frequency bands being 1.910-1.930 GHz and 2.40-2.4835 GHz for the first and second frequency bands, respectively. Oto discloses the frequency bands being between .5 and 2.5 GHz, as discussed above, in the rejection of claims 1 and 7.

However, Smith teaches a dual-band radio receiver which utilizes the 1.910 -1.930 GHz band and the 2.4-2.4835 GHz band (note Col. 3;8-18, description of frequency bands in which the radio receiver operates). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the particular frequency bands in order to expand communications capabilities by utilizing unlicensed spectrum.

Regarding claim 21, Oto discloses a method for providing a dual-band radio receiver (Fig. 1) comprising the steps of providing first (20A) and second (20B) mixers and coupling a local oscillator (22) to the first and second mixers, where the local oscillator is configured to generate signals within a third band position approximately midway between the first and second bands.



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(Note, Local oscillator covers frequencies between the first and second bands, and thus, is located between both bands). Oto fails to explicitly disclose a circuit which determines whether the RF signal input is one of the first and second bands, but discloses a splitter (52) which splits the RF signal such that the first and second bands are sent to first and second mixers, respectively.

However, Smith teaches in an analogous art, a dual-band radio receiver which includes a circuit (mode controller 103) which determines whether a received signal is in the first or second band (note, controller causes filter 117 to filter to detect appropriate signals) and couples the signal to the appropriate destination (demodulator in Smith's case, Mixer in Oto). Smith further teaches that both frequency bands can be monitored simultaneously (Col. 18;18-28 and 45-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a circuit which determines whether the RF signal is in a first or second frequency band in order to prevent errors in demodulation of the signal.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oto in view of Wagner et al (hereinafter Wagner).

Regarding claim 22, Oto discloses a dual band radio receiver (Fig. 3) comprising a local oscillator (22) configured to generate a LO signal, a first mixer device (20A) configured to receive the LO signal and a first RF signal (a) within a first band (between 500 and 1500 MHZ) and responsive to output a first IF signal, a second mixer device (20B) configured to receive the LO signal and a second RF signal (b) within a second band (between 1500 MHZ and 2500 MHZ)

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and output a second IF signal (note abstract, for both IF signals), and the local oscillator is configured to operate within a third band (900 to 2100 MHZ) located between the first and second bands (Local oscillator covers frequencies overlapping the first and second bands, and thus, is located between both bands). Oto fails to disclose that the local oscillator operates in a third band which is separate from the other two bands.

However, Wagner teaches in an analogous art, a receiver which contains two mixers (42, 72) as well as a local oscillator (VCO 46), in which the local oscillator is positioned in a third band which is located between and separate from the other two frequency bands (note abstract, Col. 3;35-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the frequency separate from the two bands in order to down convert frequencies to the same intermediate frequency.

7. Applicant's arguments filed 9/21/98 have been fully considered but they are not persuasive.

Applicant argues that Oto does not disclose that the local oscillator operates in a frequency band between the first and second RF frequency bands. The examiner respectfully disagrees. The claims must be given the broadest reasonable interpretation and as such, the current rejection is deemed valid, as the frequencies which are used are located between the overall edges of the frequency bands used for RF transmission.

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8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Smith et al disclose the use of a local oscillator located between two portions of a singular radio frequency band.

9. **Any response to this action should be mailed to:**  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**  
(703) 308-9051, (for formal communications intended for entry)

**Or:**  
(703) 305-9508 (for informal or draft communications, please label  
"PROPOSED" or "DRAFT")

*Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).*

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William Trost whose telephone number is (703) 308-5318. The examiner can normally be reached on Tuesday-Friday from 7:00 a.m to 4:30 p.m. The examiner can also be reached on alternate Mondays.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.



William Trost  
April 19, 1999